42. (Canceled)

43. (Canceled)

44. (Canceled)

45. (Canceled)

46. (Canceled)

47. (Canceled)

REMARKS

Claims 2, 4-6, 9, 11-14, 27, 29-31, 34, 36-39 remain in the application. Claims 1, 3, 7, 8, 10, 15-26, 28, 32, 33, 35 and 40-47 have been canceled without prejudice. No new matter has been added.

At ¶1 of the Office Action, the Examiner objects to the preliminary amendment filed January 24, 2000 because the new matter is not underlined. Some of the new claims added by the January 24, 2000 amendment were subsequently canceled in the present amendment. However, those claims not canceled (27, 29-31, 34, and 36 - 39) have been amended to include underlining. That objection should therefore be withdrawn.

At ¶2 of the Office Action, the Examiner states that the reissue oath/declaration filed with this application is defective because it fails to contain a statement that all errors which are being corrected in the reissue application up to the time of filing the oath/declaration arose without any deceptive intention on the part of the applicant, pursuant to 37 CFR 1.175. Accordingly, a Supplemental Reissue Application Declaration is submitted herewith including such a statement. That objection should therefore be withdrawn. A joint inventor, Wayne C. Haase, is included in the supplemental declaration. A Petition for Correction of Inventorship of Patent under 37 C.F.R. §1.324 was filed in the U.S. Patent Office on October 26, 2001 to add the joint inventor (copies included herewith). Further, a 3.73(b) certificate submitted herewith includes an executed assignment from Wayne C. Haase to Michael A. Martinelli.

At ¶3 of the Office Action, the Examiner states that the reissue oath/declaration is defective because it does not identify the mailing or post office address of each inventor. The aforementioned Supplemental Reissue Application Declaration includes those addresses. That objection should therefore be withdrawn.

At ¶4 of the Office Action, the Examiner has rejected claims 1-47 as being based on a defective reissue declaration. Since the Supplemental Declaration submitted herewith cures the defects, those rejections should be withdrawn.

At ¶5 of the Office Action, the Examiner has objected to the specification because of a missing reference to a related copending application. The Applicant has amended the specification to include the text suggested by the Examiner. That objection should therefore be withdrawn.

At ¶6 of the Office Action, the Examiner has rejected claims 1-22 under 35 U.S.C. 101 as claiming the same invention as claims 1-22 of copending Application No. 09/231,854. Since claims 1, 3, 7, 8, 10, and 15-22 have been canceled, that conflict no longer exists with respect to those claims and that objection should be withdrawn. With respect to remaining claims 2, 4, 5, 6, 9, and 11-14, the Applicant will amend the copending Application No. 09/231,854 appropriately so that claims 2, 4, 5, 6, 9, and 11-14 are no longer coextensive in scope. The rejections of claims 1-22 should therefore be withdrawn.

At ¶7 of the Office Action, the Examiner states that claims 1-22 conflict with claims 1-22 of Application No. 09/231,854. As noted above, the Applicant will amend the copending Application No. 09/231,854 appropriately so that claims 2, 4, 5, 6, 9, and 11-14 are no longer coextensive in scope

At ¶8 of the Office Action, the Examiner has rejected claims 1-3, 7-10, 13-28, 32-35 and 38-47 under 35 U.S.C. 102(e) as being anticipated by Acker et al., U.S. Patent No. 5,558,091 (the '091 patent). The Applicant has amended in a non-narrowing manner rejected claims 4, 11, 12, 29, 36, and 37 into independent form, changed the dependency on related claims 2, 9, 13, 27, 34 and 38 and canceled the remaining non-related claims without prejudice. These claims have been amended in accordance with the Examiner's statement regarding allowable claims at ¶9. Accordingly, the Applicant respectfully submits that newly amended claims 2, 4, 9, 11-13, 27, 29, 34, and 36-38 are now in condition for allowance. Those rejections should therefore be withdrawn.

All claims 2, 4, 9, 11-13, 27, 29, 34, and 36-38 are believed to be in condition for allowance. Passage to issue is requested.

The total number of claims has decreased from 47 to 12, and the number of independent claims has decreased from 12 to 6. Therefore, no additional claim fee is required. An extension fee of $920.00 pursuant to 37 CFR §1.136(a) for a reply within the third month is also enclosed. No additional costs are believed to be due in connection with the filing of this Amendment. However, should any fees be due, please charge our Deposit Account No. 50-1133. A copy of this page is enclosed for this purpose.

If the Examiner believes there are any outstanding issues to be resolved with respect to the above-identified application, he is invited to telephone the undersigned at his earliest convenience so that such issues may be resolved telephonically.

Respectfully submitted,

Date: February 5, 2003

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Version with markings to show changes made relative to previous amendment

IN THE SPECIFICATION:

Please add the following text to the specification, beginning at page 1, line 1:

-- Application Serial No. 09/231,854, filed January 14, 1999, and Application Serial No. 09/494,213, filed January 14, 2000, are copending applications which each reissues of Application Serial No. 08/490,342, filed June 14, 1995, now U.S. Patent No. 5,592,939.--

IN THE CLAIMS:

Please cancel claims 1, 3, 7, 8, 10, 15-26, 28, 32, 33, 35 and 40-47 without prejudice, and amend claims 2, 4, 9, 11-13, 27, 29, 34, and 36-38 as follows: (All claims are shown for the convenience of the Examiner. Amendments are shown relative to the amendment filed January 24, 2000.)

1. (Canceled)

2. (Amended) The method as recited in claim [1]4, wherein the step of inducing said set of orientation signal values comprises the steps of:

generating from outside said body a series of magnetic fields each penetrating at least said navigational domain and characterized substantially by a principal magnetic component in one axial dimension and relatively smaller magnetic components in two other axial dimensions.

3. (Canceled)

4. (Amended) [The method as recited in claim 3, wherein said generating step further includes the steps of:]A method of determining the location of a magnetically-sensitive, electrically conductive sensing coil affixed to a distal end of a catheter probe partially inserted into a body cavity within a navigational domain, comprising the steps of:

inducing within said sensing coil a set of orientation signal values each representative of

an orientation of said sensing coil and independent of a position of said sensing coil;

determining the orientation of said sensing coil using said induced orientation signal values;

inducing within said sensing coil a set of positional signal values each representative of the position of said sensing coil by generating from outside said body a series of magnetic fields each penetrating at least said navigational domain and characterized substantially by two principal gradient magnetic components in respective axial dimensions and a relatively smaller magnetic components in a third axial dimension;

generating said fields to provide a plurality of constant signal surfaces for the sensing coil such that an intersection between two such surfaces with components in the same axial dimensions produces a line along which said sensing coil is located;

wherein said two such surfaces are identified from among said plurality of constant signal surfaces by their ability to induce one of said positional signal values; and,

determining the position of said sensing coil using said positional signal values and said determined orientation.

5. The method as recited in claim 4, further comprises the steps of:

weighting each line in accordance with a signal strength of said corresponding constant signal surface; and

determining an intersection of said weighted lines.

6. The method as recited in claim 5, wherein six constant signal surfaces are generated to produce three intersection lines.

7. (Canceled)

8. (Canceled)

9. (Amended) The system as recited in claim [8]11, wherein [the first signal-inducing

means comprises:

field generation means for successively generating]each of the magnetic field patterns projected into said navigational domain[, each] is characterized substantially by a principal magnetic field component in one direction and relatively smaller magnetic components in two other directions.

10. (Canceled)

11. (Amended) [The system as recited in claim 10, wherein said magnetic coils are] A system for determining the location of a magnetically-sensitive, electrically conductive sensing coil affixed to a distal end of a catheter probe partially inserted into a body cavity within a navigational domain, comprising:

first signal-inducing means for inducing within said sensing coil orientation signals that are representative of the orientation of said sensing coil, including field generation means for successively generating magnetic field patterns projected into said navigational domain, wherein said field generation means comprises a set of magnetic coils disposed in a planar top of an examination deck upon which a patient is disposed during a surgical procedure;

analysis means, coupled to said first signal-inducing means, for determining the orientation of said sensing coil using said induced orientation signals and independent from a position of said sensing coil;

second signal-inducing means for inducing within said sensing coil position signals that are representative of the position of said sensing coil; and

analysis means, coupled to said second signal-inducing means, for determining the position of said sensing coil using said determined orientation and said induced position signals.

12. (Amended) [The system as recited in claim 10, wherein said magnetic coils are] A system for determining the location of a magnetically-sensitive, electrically conductive sensing coil affixed to a distal end of a catheter probe partially inserted into a body cavity within a navigational domain, comprising:

first signal-inducing means for inducing within said sensing coil orientation signals that are representative of the orientation of said sensing coil, including field generation means for successively generating magnetic field patterns projected into said navigational domain, wherein said field generation means comprises a set of magnetic coils disposed in a planar top and in rail members edge supported by said planar top for an examination deck upon which a patient is disposed during a surgical procedure;

analysis means, coupled to said first signal-inducing means, for determining the orientation of said sensing coil using said induced orientation signals and independent from a position of said sensing coil;

second signal-inducing means for inducing within said sensing coil position signals that are representative of the position of said sensing coil; and

analysis means, coupled to said second signal-inducing means, for determining the position of said sensing coil using said determined orientation and said induced position signals.

13. (Amended) The system as recited in claim [8]11, wherein the second signal-inducing means comprises:

field generation means for successively generating magnetic field patterns each characterized by a first and second gradient field component in respective directions and a relatively smaller third component in another direction.

14. The system as recited in claim 13, wherein the field generation means comprises a magnetic coil assembly.

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (Canceled)

22. (Canceled)

23. (Canceled)

24. (Canceled)

25. (Canceled)

26. (Canceled)

27. (Amended) The method as recited in claim [26]29, wherein the step of inducing said set of orientation signal values comprises the steps of:

generating from outside said body a series of magnetic fields each penetrating at least said navigational domain and characterized substantially by a principal magnetic component in one axial dimension and relatively smaller magnetic components in two other axial dimensions.

28. (Canceled)

29. (Amended) [The method as recited in claim 28, wherein said generating step further includes the steps of:] A method of determining the location of a magnetically-sensitive, electrically conductive sensing coil in a navigational domain within a body, comprising the steps

of:

inducing within said sensing coil a set of orientation signal values each representative of an orientation of said sensing coil and independent of a position of said sensing coil;

determining the orientation of said sensing coil using said induced orientation signal values;

inducing within said sensing coil a set of positional signal values each representative of the position of said sensing coil by generating from outside said body a series of magnetic fields each penetrating at least said navigational domain and characterized substantially by two principal gradient magnetic components in respective axial dimensions and a relatively smaller magnetic components in a third axial dimension;

generating said fields to provide a plurality of constant signal surfaces for the sensing coil such that an intersection between two such surfaces with components in the same axial dimensions produces a line along which said sensing coil is located;

wherein said two such surfaces are identified from among said plurality of constant signal surfaces by their ability to induce one of said positional signal values; and,

determining the position of said sensing coil using said positional signal values and said determined orientation.

30. The method as recited in claim 29, further comprises the steps of:

weighting each line in accordance with a signal strength of said corresponding constant signal surface; and

determining an intersection of said weighted lines.

31. The method as recited in claim 30, wherein six constant signal surfaces are generated to produce three intersection lines.

32. (Canceled)

33. (Canceled)

34. (Amended) The system as recited in claim [33]36, wherein [the first signal-inducing means comprises:

field generation means for successively generating]each of the magnetic field patterns projected into said navigational domain[, each] is characterized substantially by a principal magnetic field component in one direction and relatively smaller magnetic components in two other directions.

35. (Canceled)

36. (Amended) [The system as recited in claim 35, wherein] A system for determining the location of a magnetically-sensitive, electrically conductive sensing coil in a navigational domain within a body, comprising:

first signal-inducing means for inducing within said sensing coil orientation signals that are representative of the orientation of said sensing coil, including field generation means for successively generating magnetic field patterns projected into said navigational domain, wherein said field generation means comprises a set of magnetic coils and said magnetic coils are disposed in a planar top of an examination deck upon which a patient is disposed during a surgical procedure;

analysis means, coupled to said first signal-inducing means, for determining the orientation of said sensing coil using said induced orientation signals and independent from a position of said sensing coil;

second signal-inducing means for inducing within said sensing coil position signals that are representative of the position of said sensing coil; and,

analysis means, coupled to said second signal-inducing means, for determining the position of said sensing coil using said determined orientation and said induced position signals.

37. (Amended) [The system as recited in claim 35, wherein] A system for determining the

location of a magnetically-sensitive, electrically conductive sensing coil in a navigational domain within a body, comprising:

first signal-inducing means for inducing within said sensing coil orientation signals that are representative of the orientation of said sensing coil, including field generation means for successively generating magnetic field patterns projected into said navigational domain, wherein said field generation means comprises a set of magnetic coils and said magnetic coils are disposed in a planar top and in rail members edge supported by said planar top for an examination deck upon which a patient is disposed during a surgical procedure;

analysis means, coupled to said first signal-inducing means, for determining the orientation of said sensing coil using said induced orientation signals and independent from a position of said sensing coil;

second signal-inducing means for inducing within said sensing coil position signals that are representative of the position of said sensing coil; and,

analysis means, coupled to said second signal-inducing means, for determining the position of said sensing coil using said determined orientation and said induced position signals.

38. (Amended) The system as recited in claim [33]36, wherein the second signal-inducing means comprises:

field generation means for successively generating magnetic field patterns each characterized by a first and second gradient field component in respective directions and a relatively smaller third component in another direction.

39. The system as recited in claim 38, wherein the field generation means comprises a magnetic coil assembly.

40. (Canceled)

41. (Canceled)

42. (Canceled)

43. (Canceled)

44. (Canceled)

45. (Canceled)

46. (Canceled)

47. (Canceled)